

**To:** Way, Steven[way.steven@epa.gov]  
**Cc:** Christner, Jan[Jan.Christner@WestonSolutions.com]; Matt Francis  
(m.francis@erllc.com)[m.francis@erllc.com]  
**From:** Petri, Elliott  
**Sent:** Thur 7/9/2015 5:58:26 PM  
**Subject:** RE: Water Treatment Quantity Estimates and Granular Flocculant Feed System  
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Hi Steve,

Updating the flowrate at RnB to 500 GPM, the schedule to 7 days of treatment, and adjusted the flow at the Gold King to 150 GPM. Using the treatment system information from last year I have put together the following estimate for Flocculant and Caustic needed:

	Red and Bonita	Gold King	Total
Flowrate	500 gallons per minute (GPM)	150 GPM (estimated)	
Days Treated (10 hrs/day)	7 Days (70 Hours)	10 Days (100 Hours)	
Factor of Safety	100%	100%	
NaOH Addition Rate	0.275 GPM	0.0825 GPM	
<b>25% NaOH (gallons)</b>	<b>2310 gallons</b>	<b>990 gallons</b>	<b>3300 gallons</b>
Brenflocc Addition rate	0.0083 lb/min	0.0025 lb/min	
<b>Brenflocc AP 2631 (lbs)</b>	<b>70 lbs</b>	<b>30 lbs</b>	<b>100 lbs</b>

I have copied Matt so he can adjust his order for caustic if needed. Please let us know so he can order more if need be.

Thanks,  
Elliott

Elliott Petri, PE

Weston Solutions, Inc.

1435 Garrison St, Ste 100

Lakewood, CO 80215

Ph: 303-729-6156

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Fax: 303-729-6101

**From:** Petri, Elliott

**Sent:** Friday, May 22, 2015 8:52 AM

**To:** Way, Steven (way.steven@epa.gov)

**Cc:** Christner, Jan

**Subject:** Water Treatment Quantity Estimates and Granular Flocculant Feed System

Hi Steve,

Using the treatment system information from last year I have put together the following estimate for Flocculant and Caustic needed:

	Red and Bonita	Gold King	Total
Flowrate	300 gallons per minute (GPM)	100 GPM (estimated)	
Days Treated (10 hrs/day)	10 Days (100 Hours)	10 Days (100 Hours)	
Factor of Safety	2.0	2.0	
NaOH Addition Rate	0.165 GPM	0.033 GPM	
<b>25% NaOH (gallons)</b>	<b>2000 gallons</b>	<b>660 gallons</b>	<b>2660 gallons</b>
Brenflocc Addition rate	0.0050 lb/min	0.0010 lb/min	
<b>Brenflocc AP 2631 (lbs)</b>	<b>60 lbs</b>	<b>20 lbs</b>	<b>80 lbs</b>

I have also been researching a feeder to mix and distribute the flocculant at RnB and Gold King, I found a company that rents and sells units (new and used) that are designed for mixing dry flocculant into water. I gave them some basic parameters and they have a used unit in stock that should meet our needs.

•□□□□□□□ The company and units are American based:

Clearwater Industries, Inc.

9446 North 107th Street.

Milwaukee, WI 53224

<http://www.clearwaterind.com/>

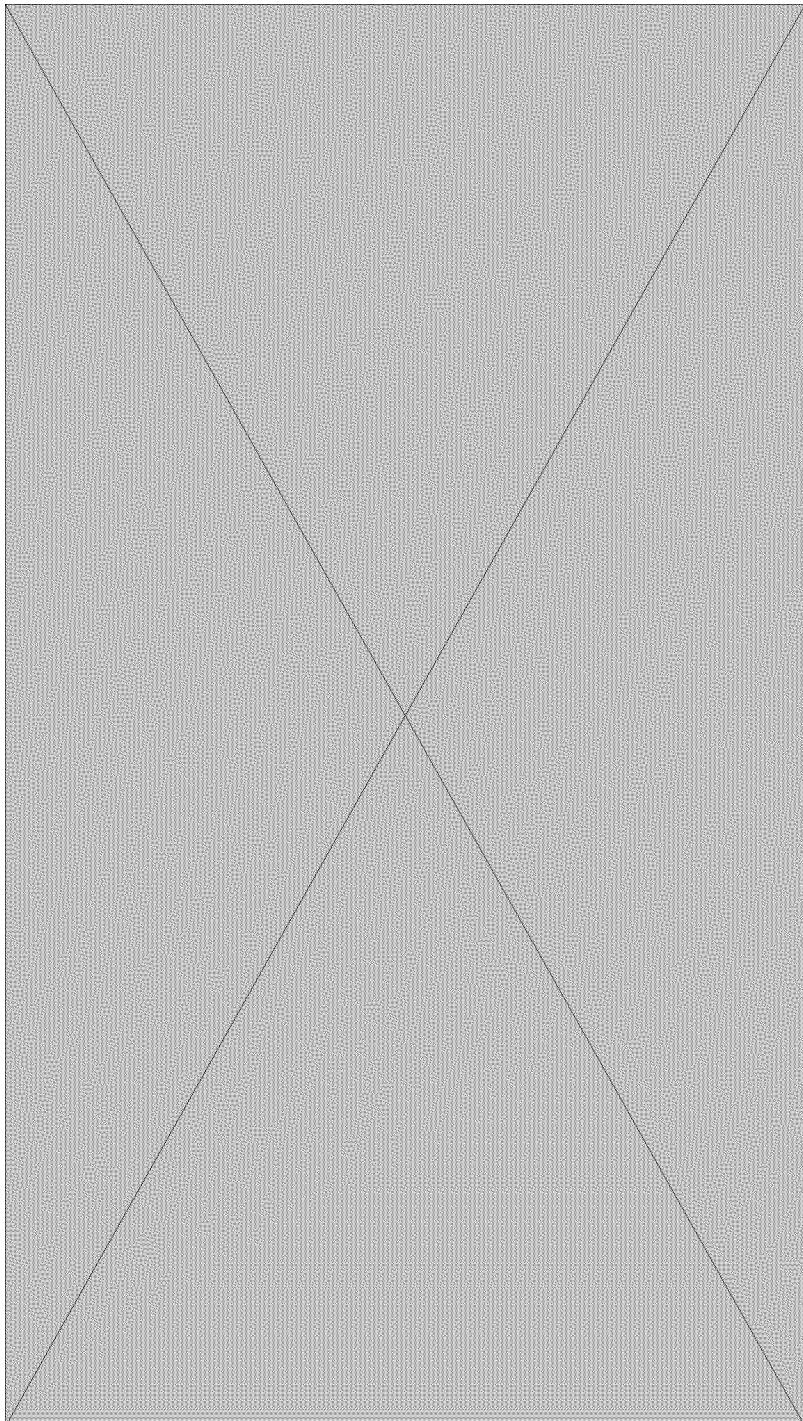
•□□□□□□□□ They have both rent and buy options available and I have attached the quote for the used unit shown below.

- Rent \$2400/month
- Buy \$5650

•□□□□□□□□ The unit has adjustable feeder rates if field adjustment is needed.

•□□□□□□□□ Water quality needed to be used for intake/dilution:

- The unit can include a wye strainer for removing particulate matter from water, although using clean water for dilution of the flocculant frees up more bonding sites.
- They his will be a very simple system so little risk of clogging ports or valves.



Let me know if you would like additional information or if you would prefer we pursue other alternatives for the flocculant feeder system. If you would like to use this unit, it requires 2 weeks to ship from placement of order and receipt of down payment (if buying).

Thanks,

Elliott

**Elliott Petri, PE**

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